

## FIVE THINGS TO KNOW ABOUT ...

## Fentanyl misuse

Shannon Ruzycki MD, Mark Yarema MD

## Fentanyl-related deaths are increasing worldwide

More than 1000 fentanyl-related deaths occurred in Canada during 2009–2014.<sup>1</sup> In the United States, an abrupt rise in opioid-related deaths has been attributed to increased fentanyl misuse, resulting in a health advisory from the US Centers for Disease Control and Prevention.<sup>2</sup>

## The hallmark of fentanyl toxicity is respiratory depression

The triad of respiratory depression, miosis and altered level of consciousness represent key features of opioid toxicity and should alert physicians to the possibility of fentanyl poisoning.<sup>3</sup>

## Naloxone is an opioid-antagonist that can reverse life-threatening fentanyl overdose

Naloxone can be delivered (in order of decreasing bioavailability) intravenously, intramuscularly, subcutaneously, endotracheally, intranasally or intralingually.<sup>3</sup> Reversal of toxicity occurs one to eight minutes after administration.<sup>3,4</sup> Recent Advanced Cardiovascular Life Support guidelines recommend empiric use of naloxone in treatment algorithms for respiratory depression or cardiac arrest.<sup>4</sup> Up to six times the usual 0.4-mg dose of naloxone may be required because of the increased potency of fentanyl compared with other opioids and the unpredictable amount of fentanyl in each pill.<sup>3</sup>

## There is a difference between pharmaceutical and nonpharmaceutical fentanyl

Pharmaceutical fentanyl may be extracted for misuse from transdermal patches. The fentanyl is then consumed via inhalation, intravenously or orally.<sup>3</sup> Nonpharmaceutical fentanyl is synthesized as powder in illicit laboratories.<sup>1</sup> This powder is cut with other drugs such as heroin and xylazine and pressed into tablets to mimic oxycodone<sup>1</sup> (Figure 1).



Figure 1: Counterfeit 80-mg oxycodone tablets containing non-pharmaceutical fentanyl confiscated by the Calgary Police Service.

## Take-home naloxone (THN) kits are an effective, safe way to reduce fentanyl-related deaths

The kits consist of two doses of intramuscular naloxone, rescue-breathing masks and pamphlets on overdose management.<sup>5</sup> Seven of the 13 provinces and territories have a dedicated THN program.<sup>6</sup> Health Canada recently removed naloxone from the Prescription Drug List for emergency use for opioid overdose outside hospital settings, thereby broadening access.<sup>6</sup> One study has shown that distribution of THN kits in British Columbia reversed 85 opioid overdoses in 20 months.<sup>5</sup>

## References

1. Deaths involving fentanyl in Canada, 2009–2014. In: *Bulletin CCENDU*. Ottawa: Canadian Centre on Substance Abuse; 2015. Available: [www.ccsa.ca/Resource%20Library/CCSA-CCENDU-Fentanyl-Deaths-Canada-Bulletin-2015-en.pdf](http://www.ccsa.ca/Resource%20Library/CCSA-CCENDU-Fentanyl-Deaths-Canada-Bulletin-2015-en.pdf) (accessed 2016 Mar. 22).
2. US Centers for Disease Control and Prevention. Increases in fentanyl drug confiscations and fentanyl-related overdose fatalities. Atlanta: CDC Health Alert Network; 2015. Available: [emergency.cdc.gov/han/han00384.asp](http://emergency.cdc.gov/han/han00384.asp) (accessed 2016 Mar. 22).
3. Boyer EW. Management of opioid analgesic overdose. *N Engl J Med* 2012;367:146–55.
4. Lavonas EJ, Drennan IR, Gabrielli A, et al. Part 10: special circumstances of resuscitation: 2015 American Heart Association guidelines update for cardiopulmonary resuscitation and emergency cardiovascular care. *Circulation* 2015;132(Suppl 2):S501–18.
5. Banjo O, Tzemis D, Al-Qutub D, et al. A quantitative and qualitative evaluation of the British Columbia Take Home Naloxone program. *CMAJ Open* 2014;2:E153–61.
6. The availability of take-home naloxone in Canada. In: *Bulletin CCENDU*. Ottawa: Canadian Centre on Substance Abuse; 2016. Available: [www.ccsa.ca/Resource%20Library/CCSA-CCENDU-Take-Home-Naloxone-Canada-2016-en.pdf](http://www.ccsa.ca/Resource%20Library/CCSA-CCENDU-Take-Home-Naloxone-Canada-2016-en.pdf) (accessed 2016 Apr. 6).

**Competing interests:** None declared.

This article has been peer reviewed.

**Affiliations:** Department of Medicine (Ruzycki, Yarema), University of Calgary; Section of Clinical Pharmacology and Toxicology (Yarema), Alberta Health Services; Poison and Drug Information Service (Yarema), Alberta Health Services, Calgary, Alta.

**Correspondence to:** Shannon Ruzycki, [sarro@ualberta.ca](mailto:sarro@ualberta.ca)

*CMAJ* 2016. DOI:10.1503/cmaj.151378